

REMARKS

The Applicant thanks the Examiner for indicating that the claims 21, 23 and 28 would be allowable if rewritten with all the limitations of the claims from which they depend. Claim 21 is accordingly amended to be in independent form and include all the limitations of claims 18, 20. Claim 23 is accordingly amended to be in independent form and include all the limitations of claims 18, 22. Claim 28 is accordingly amended to be in independent form and include all the limitations of claims 26, 27.

Claims 27-28 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for the reasons noted in the official action. The rejected claims are accordingly amended, by the above claim amendments, and the presently pending claims are now believed to particularly point out and distinctly claim the subject matter regarded as the invention, thereby overcoming all of the raised § 112, second paragraph, rejections. Specifically, the Examiner has objected to claim 27 because being dependent on itself. For the purpose of examination the Examiner has interpreted the claim as dependent on claim 26. This was what the Applicant intended and thanks the Examiner for pointing out the error and acting on the intended interpretation. The Applicant has herein canceled claim 27 and has incorporated the subject matter of claim 27 into newly independent claim 26.

Claims 18-20, 22, 24 and 29 are rejected, under 35 U.S.C. § 102, as being anticipated in view of Nightingale `388 (U.S. Patent No. 5,297,388). The Applicant acknowledges and respectfully traverses the raised anticipatory rejection in view of the following remarks.

With regard to this rejection, the Applicant notes reference to "Szuminski" in the first line of paragraph 9 of the action and believes this reference was intended to be made to Nightingale `388. The Applicant believes that the Examiner's explanation of the basis for claim-rejection gives confirmation that reference to Szuminski was intended to be made to Nightingale `388.

Claims 18 and 19 have been canceled.

The Applicant believes that amended claim 20 includes limitations which clearly distinguish the claimed invention from the teachings of Nightingale `388.

Nightingale `388 relates to an engine in which the output stream of high-pressure air from a front fan 2 is supplied to a by-pass duct 4 and a compressor 6 that feeds a combustor section 8 of the engine. The hot gas stream from the combustor section 8 passes through a turbine 10 and mixer 12 into a jet-pipe duct 14 which may include an afterburner 16 and which terminates in an axial discharge nozzle 18 of variable area. The by-pass air from the duct 4 is mixed in the jet-pipe duct 14 with the hot gas stream exiting the mixer 12

The Nightingale `388 engine has side outlet ports 20 and 22 through which cold air from the fan 2 may be selectively diverted from the annular by-pass duct 4 via individual ducts 28 and 30 to respective vertical-lift nozzles 24 and 26. Nightingale `388 fails to teach the basis on which air is diverted from the duct 4 to the respective nozzles 24 and 26, but this and the implication from lines 45-49, column 3 of the cited patent, is that the same amount of air is supplied to both nozzles 24 and 26.

The engine also has side outlet ports 34 and 36 through which the mixed gas from the jet-pipe duct 14 may be selectively diverted to respective vectoring nozzles 38

and 40. A diverter valve means 42, which comprises a sleeve valve 44 and a blocker valve made up of valve segments 46, is located adjacent the side outlet ports 34 and 36, and when fully deployed blocks duct 14. The blocker valve segments 46 are deployed to a selected extent between open and closed conditions. In the open condition (Fig. 2e) they are fully retracted or stowed to leave the duct 14 fully open for gas supply to the axial discharge nozzle 18, whereas in the closed condition (Fig. 2a) they are fully deployed closing the duct 14 from supplying gas to the nozzle 18.

As the valve segments 46 move from the fully open to the fully closed condition, the sleeve valve 44 moves from an axial disposition in which the ports 34 and 36 are fully closed by it, to an axial disposition in which they are fully open. Between these two extremes of the segments 46 and valve 44, the hot gas is supplied in part via the two partially-open ports 34 and 36 to the vectoring nozzles 38 and 40, and in the remainder to the axial discharge nozzle 18. The variable splitting of gas is limited between (i) the vectoring nozzles 38 and 40, and (ii) the nozzle 18. There is no variable splitting of gas between the two ports 34 and 36, and the respective vectoring nozzles 38 and 40. The nozzles 38 and 40 always receive the same volume of gas as one another irrespective of the proportion of gas supplied to the nozzle 18.

Thus, in the engine taught by Nightingale '388 the high-pressure air stream produced in the jet-pipe duct 14 is split by the diverter valve 42 between the three air-jet nozzles 38, 40 and 18. When the blocker valve segments 46 of the diverter valve 42 are moved to vary the division of gas between (i) the vectoring nozzles 38 and 40 and (ii) the nozzle 18, the sleeve valve 44 is also moved correspondingly to vary the extent to which the ports 34 and 36 supplying the nozzles 38 and 40 respectively, are

open/closed. The ports 34 and 36 are at all times open/closed to the same extent as one another so that whereas the volume of gas supplied via the ports 34 and 36 to their respective nozzles 38 and 40, changes with movement of the sleeve valve 44, the volume of gas supplied via the port 34 remains the same as the volume supplied via the port 36 irrespective of movement of the sleeve valve 44. Gas is split between the two ports 34 and 36, but the proportions of the split do not change, each port 34 and 36 receives the same proportion of the gas as the other.

In rejecting Claim 20 the Examiner has equated the "splitter plate" of the claim with the annular sleeve valve 44 Nightingale `388 and the "first and second duct-entry openings" of the claim with the ports 34 and 36 of Nightingale `388. The Examiner then goes on to liken the "control-blade device" of the claim to the valve segments 46 of Nightingale `388, and links with it (through quotation from the claim) "means for selectively adjusting the angular displacement of the control-blade device for varying the proportions by which air of the high pressure air stream is split between the first and second duct entry openings.". This "means for adjusting" is equated by the Examiner with the Nightingale `388 actuators 52, and whereas the valve segments 46 are indeed adjusted by the actuators 52, however the adjustment made thereby does not vary the proportions by which air of the high pressure stream is split between the Nightingale `388 ports 34 and 36 - that is to say between the "first and second duct-entry openings".

As explained above, there is no variable splitting of gas between the two ports 34 and 36 and their respective vectoring nozzles 38 and 40; they always receive the same volume of gas as one another regardless of whether, or the extent to which, the segments 46 are deployed.

Amended Claim 20 is an independent claim that includes all the limitations of Claim 18 on which it was dependent, and in the light of the above is believed to be clearly distinguished from the Nightingale `388 teachings by the combination of claimed features which include:

- (a) a control-blade device mounted for angular displacement relative to the first and second duct-entry openings to vary the proportions by which air of the high-pressure air-stream is split between the first and second duct-entry openings; and
- (b) means for selectively adjusting the angular displacement of the control-blade device for varying the proportions by which air of the high-pressure air stream is split between the first and second duct-entry openings.

These distinctive features of the ducted air power plant as claimed provide an important operational advantage over the teachings of the Nightingale `388 patent. In the Nightingale `388 patent, the ports 34 and 36 supply their respective port and starboard nozzles 38 and 40 with the same volumes of air as one another. The volume supplied to each nozzle 38 and 40 is variable according to the adjustment of the divider valve 42 (specifically the sleeve valve 44), however the proportional relationship between the volumes of air supplied to them individually, remains the same (equal). In distinction, with the claims of the present invention in which the proportional relationship is selectively adjustable, there is the added control variable of varying the proportion in which the air is split between the nozzles. This added facility provides for more accurate and direct control of the thrusts produced by the nozzles individually, and especially thereby in the context of VTOL allows for very accurate and sensitive vertical and other aircraft maneuvers.

The Applicant respectfully submits, due to the above claimed distinctions, that amended Claim 20 is patentable over the Nightingale `388 reference.

The Examiner's rejection of Claim 22 is based on essentially the same grounds as the grounds for rejection of Claim 20 which has been discussed above. Claim 22 has been amended to be in independent form and based on the limitations of Claim 18, and include the limitations of features:

- (a) splitter plate defining four duct-entry openings for individual ones of the subsidiary air streams,

- (b) four control-blade devices each associated with a respective pair of the four duct-entry openings, each control-blade device being mounted for angular displacement relative to the two duct-entry openings of its respectively-associated pair of duct-entry openings to vary the proportions by which the high-pressure air-stream is split between the two duct-entry openings of the pair of duct-entry openings associated with that respective control-blade device, and

- (c) means for selectively adjusting the angular displacement of each control-blade device for varying the proportions by which the high-pressure air-stream is split between the two duct-entry openings of the pair of duct-openings associated with that respective control-blade device.

As discussed above, Nightingale `388 does not teach or suggest the combination of the above claim limitations (b) and (c), namely of control-blade devices each mounted as specified to vary the proportions by which there is split between the two duct-entry openings of a respectively-associated pair of duct-entry openings, and means for selectively adjusting the angular displacement of the control-blade device for

varying the proportions of the split. Nor does Nightingale `388 disclose the claimed limitation of (a) a splitter plate that defines four duct-entry openings for individual subsidiary air streams to respective air-jet nozzles.

The Applicant respectfully submits, due to the above claimed distinctions, that amended Claim 22 is patentable over the Nightingale `388 reference. Claim 24 is directly dependent on amended Claim 22, and accordingly includes all the limitations of amended Claim 22. It is therefore submitted that Claim 24 is patentable over Nightingale `388.

Claim 25 is rejected, under 35 U.S.C. § 103, as being unpatentable over Nightingale `388 in view of Szuminski et al. `935 (U.S. Patent No. 4,713,935). The Applicant acknowledges and respectfully traverses the raised obviousness rejection in view of the above amendments and the following remarks.

Claim 25 has been amended to be dependent on Claim 22, and is accordingly distinguished from the teaching of Nightingale `388 by the combination of the three claim limitations (a)-(c) identified above in relation to Claim 22. The Applicant asserts that Szuminski et al `935 also fails teach any of these limitations (a)-(c). Accordingly it is submitted that amended Claim 25 is patentable over Nightingale `388 in view of Szuminski et al. `935.

Claim 26-27 are rejected, under 35 U.S.C. § 103, as being unpatentable over Nightingale `388 in view of Howes `154 (U.S. Patent No. 3,341,154). The Applicant acknowledges and respectfully traverses the raised obviousness rejection in view of the above amendments and the following remarks.

Claim 26 has been amended to include all the subject matter of Claim 27, which has been canceled, and in this regard is directed to a craft having a VTOL capability, that incorporates a ducted air power plant, which includes the limitations of:

(a) a splitter plate defining four duct-entry openings for individual ones of the subsidiary air streams,

(b) four control-blade devices each associated with a respective pair of the four duct-entry openings, each control-blade device being mounted for angular displacement relative to the two duct-entry openings of its respectively-associated pair of duct-entry openings to vary the proportions by which the high-pressure air-stream is split between the two duct-entry openings of the pair of duct-entry openings associated with that respective control-blade device, and

(c) a means for selectively adjusting the angular displacement of each control-blade device for varying the proportions by which the high-pressure air-stream is split between the two duct-entry openings of the pair of duct-openings associated with that respective control-blade device.

As argued above, Nightingale `388 fails to teach the combination of the above limitations (b) and (c), namely of control-blade devices each mounted as specified to vary the proportions by which there is split between the two duct-entry openings of a respectively-associated pair of duct-entry openings, and means for selectively adjusting the angular displacement of the control-blade device for varying the proportions of the split. Nor does Nightingale `388 teach the limitation of (a) a splitter plate that defines four duct-entry openings for individual subsidiary air streams to respective air-jet nozzles.

Howes `154 also fails to teach any of the above limitations of (a)-(c). As such The Applicant respectfully submits, due to the above claimed distinctions, that amended Claim 26 is patentable over Nightingale `388 in view of Howes 154.

If any further amendment to this application is believed necessary to advance prosecution and place this case in allowable form, the Examiner is courteously solicited to contact the undersigned representative of the Applicant to discuss the same.

In view of the above amendments and remarks, it is respectfully submitted that all of the raised rejection(s) should be withdrawn at this time. If the Examiner disagrees with the Applicant's view concerning the withdrawal of the outstanding rejection(s) or applicability of the Nightingale `388, Szuminski et al. `935 and/or Howes `154 references, the Applicant respectfully requests the Examiner to indicate the specific passage or passages, or the drawing or drawings, which contain the necessary teaching, suggestion and/or disclosure required by case law. As such teaching, suggestion and/or disclosure is not present in the applied references, the raised rejection should be withdrawn at this time. Alternatively, if the Examiner is relying on his/her expertise in this field, the Applicant respectfully requests the Examiner to enter an affidavit substantiating the Examiner's position so that suitable contradictory evidence can be entered in this case by the Applicant.

In view of the foregoing, it is respectfully submitted that the raised rejection(s) should be withdrawn and this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

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The Applicant respectfully requests that any outstanding objection(s) or requirement(s), as to the form of this application, be held in abeyance until allowable subject matter is indicated for this case.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,



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